Novel Technology for Radiation Protection

Completed Technology Project (2013 - 2014)

Project Introduction

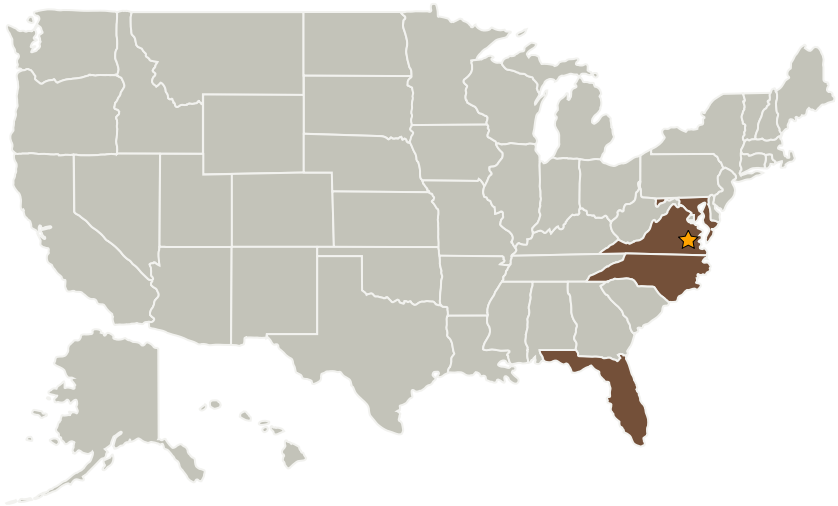
The purpose of this project is to assess and compare the efficacy of different cerium oxide nanoparticles (CNPs) formulation to mitigate lung injury following exposure to potentially lethal doses of radiation.

Radiation exposure to living tissue generates free radicals through ionizing reaction such as photoelectric effect, Compton and Auger effects. Radiation induced lung damage (pneumonitis/fibrosis) is the leading cause of death in persons acutely exposed to radiation when gastrointestinal and hematopoietic syndromes are successfully treated. Our preliminary study has shown that CNPs protect from radiobiological effects of photons on healthy tissue. Successful completion would lead to an effective and safe method for restoring normal tissue function and improving survival following acute radiation exposure.

Anticipated Benefits

Successful completion would lead to an effective and safe method for restoring normal tissue function and improving survival following acute radiation exposure.

Primary U.S. Work Locations and Key Partners



Novel Technology for Radiation Protection

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Organizational Responsibility

Responsible Mission Directorate:

Mission Support Directorate (MSD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Center Independent Research & Development: LaRC IRAD

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia

Co-Funding Partners	Type	Location
Duke University	Academia	Durham, North Carolina
East Carolina University	Academia	Greenville, North Carolina
Pacific Northwest National Laboratory(PNNL)	R&D Center	Richland, Washington
University of Central Florida(UCF)	Academia	Orlando, Florida
University of Maryland-College Park(UMCP)	Academia	College Park, Maryland

Primary U.S. Work Locations	
Florida	Maryland
North Carolina	Virginia

Project Management

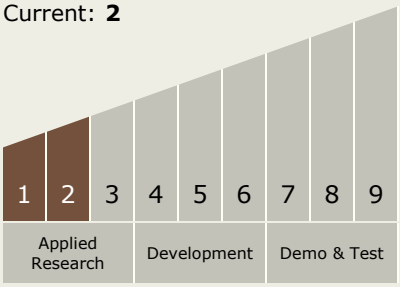
Program Manager:
Julie A Williams-byrd

Project Manager:
Ram K Tripathi

Principal Investigator:
Ram K Tripathi

Technology Maturity (TRL)

Start: **1**
Current: **2**



Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.5 Radiation
    - TX06.5.2 Radiation Mitigation and Biological Countermeasures